PRELIMINARY RESULTS FROM A STUDY OF A CENTRAL QUEENSLAND COASTAL PRAWN FISHERY

As part of an evaluation of seasonal closures, an ongoing study is being carried out to determine the species composition, spatial and temporal distribution, recruitment, growth, and mortality in the multi-species penaeid prawn fishery in the Bowen–Mackay region.

Analysis of QFMA and a restricted number of research log books show that tiger, king and banana prawn are the dominant commercial species 'groups' caught in the region. Bananas and tigers are taken in large numbers inshore throughout the region with the kings coming from the near reef and inshore at Mackay. In 1988 and 1989 fishing effort peaked immediately after the seasonal closure ended and dropped to a very low level by the following December.

Results from night-time research trawls show both spatial and inter-annual differences in species composition and recruitment timing. In January–May 1989 the tiger prawns, *Penaeus esculentus* and *P. semisulcatus* comprised 41.3% and 31.4% respectively of commercial species caught at the Bowen site. At Mackay, 100 km to the south, the catch consisted of 60.3% *P. esculentus* and only 4% *P. semisulcatus*. Banana prawns *P. merguiensis*, were caught at both sites but numbers were highly variable. Western king prawns, *P. latisulcatus*, were most abundant off Mackay. Endeavour prawns *Metapenaeus ensis* and *M. endeavouri* made up the remainder of the catch at both sites.

In 1988/89, *P. esculentus* displayed a single prolonged recruitment apparently peaking in late spring and summer. *P. semisulcatus* appeared to have two recruitment pulses, one in spring and a second in late summer to early autumn. *P. latisulcatus* appeared to have one spring/summer pulse while *P. merguiensis* displayed a number of possible recruitment pulses. In 1989/90, the recruitment pulses of all species appeared to be reduced and delayed.

Von Bertalanffy growth parameters have been estimated for the two tiger prawn species from tagging studies. The pattern of tag recaptures suggest a slow dispersal rather than definite migration of these prawn. The pattern of fishing effort as shown in the research logbooks was relatively even with areas of peak effort matching the areas of highest tag recapture. Further tagging studies of the king and banana stocks are being carried out at present.

Net selection was investigated using the 'alternate haul' method to compare the 39 mm stretch mesh nets used in the research trawls with both a 19 mm mesh and the commercially used 52 mm mesh. A similar technique was used to compare the research beam trawl gear with the industry standard otter board gear.

These data have been used as parameter estimates for a preliminary yield per recruit model of this fishery, described in a companion paper (Dredge and Gribble, 1991).

Literature Cited

Dredge, M.C.L. and Gribble, N.A. 1991. Evaluation of seasonal closures as a means of optimising yeild from a multi-species prawn fishery. Memoirs of the Queensland Museum 31: 451.

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LABORATORY VALUATIONS OF THE EFFECT ON THE EASTERN ROCK LOBSTER, *JASUS VERREAUXI* (H. MILNE EDWARDS), OF TAGGING WITH EXTERNAL OR INTERNAL TAGS OR MARKINGS

Three types of anchor tag (toggle, T-anchor and dart) and a mark (V notch in the right uropod) were assessed under controlled conditions for the effects of tagging on the mortality in eastern rock lobsters (*Jasus verreauxi*). In each of six pens in a 1 x 10^6L pool were five lobsters (75–120mm C.L.) from each sex chosen at random. An equal number of untreated lobsters were placed in two remaining pens. After 84 weeks the experiment was terminated. The null hypothesis that there was no difference between treatments in lobster mortality or tag and mark loss was tested using the χ^2 test. We found no difference in mortality between lobsters that were tagged or marked. The mortality among untagged control lobsters was greater however than that of the tagged or marked lobsters. There were no differences between external tag types in the number of tagged lobsters that lost their tag. None of the marked lobsters lost their mark. We found no differences in apparent mortality (mortality plus tag loss) between lobsters tagged with different types of external tags. The apparent mortality among marked lobsters was less than that among those tagged with external tags.

In another experiment in the same pool, 40 lobsters, chosen at random were tagged with visual implant tags and placed in a pen adjacent to one containing an equal number of untagged controls. The experiment was terminated after 48 weeks. The null hypothesis that there was no difference in mortality between lobsters tagged with visual implant tags or untagged controls was tested using the χ^2 test. No differences in mortality between tagged and untagged lobsters were found. However, 43% of the tagged lobsters lost their tag.

We concluded that no one type of external tag tested was better than the others. In a field marking experiment we would expect a greater proportion of lobsters to survive and retain their mark up to 84 weeks than if a similar experiment were done using the types of external tag tested in our experiment. The visual implant tag has potential especially for experiments under controlled conditions. However, tagging techniques need to be improved so that the rate of tag loss can be reduced.

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